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TECHNOLOGY DEPARTMENT

February 26, 1949

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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A SCIENCE SERVICE PUBLICATION

$5.50 A YEAR

VOL. 55 NO. 9

MEDICINE

Vitamin B_{12} Aids Anemics

Striking improvement has been noted in patients with several types of anemia following injection of the vitamin.

➤ VITAMIN B_{12} is "the most effective antianemic substance known," an eight-man medical team reports in the the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 19).

The eight men are: Dr. Tom D. Spies, Birmingham, Ala.; Dr. Ramon M. Suarez, San Juan, Puerto Rico; Dr. Guillermo Garcia Lopez and Dr. Fernando Milanes, Havana, Cuba; Dr. Robert E. Stone, Birmingham, Ala.; Dr. Ruben Lopez Toca and Dr. Thomas Aramburu, Havana, Cuba; and Dr. Sam Kartus, Birmingham, Ala.

Their verdict is based on experiences with a group of 35 patients. Some of these had sprue, others a form of anemia termed nutritional macrocytic anemia, and the rest had pernicious anemia. Fourteen of the pernicious anemia patients had the severe form of the disease in which the spinal cord is affected.

In each case, striking improvement followed injection of the vitamin. Between the third and the fifth day the patients said they felt stronger and that their appetites had returned. Laboratory tests showed that new red blood cells were being formed and their blood was getting less and less anemic.

The pain, stiffness, tingling and numbness of pernicious anemia patients with spinal cord degeneration got better during the first 10 days after injection of the vitamin. Within two weeks a dramatic improvement was seen. One woman had been unable to arise from a sitting position and to walk without help. She had great difficulty using a knife and fork, buttoning her clothes, combing her hair and picking up and handling small objects. On the fourth day of treatment she was able to walk without support and could feel with her fingers differences in textures. Her case is reported as typical of the results of the vitamin treatment.

This vitamin is less than a year old. Its isolation in crystalline form was first announced in April, 1948, by a group of researchers at Merck and Co. (*See SNL*, April 24, 1948). Dr. Spies and associates state that it is the only pure chemical known to be effective in relieving the nerve disorder, subacute combined degeneration, in patients with pernicious anemia.

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COMMUNICATIONS

Pact Changes Call Signs

➤ CHANGES in the radio station call signs in the nonbroadcast services, by which stations identify themselves on the air, are being made to comply with agreements resulting from the International Tele-communication and Radio Conference held in 1947, the Federal Communications Commission has revealed.

Under this agreement, the alphabet is apportioned among the nations for such use. The first letter identifies the nationality of the station. The United States is allotted four initial or key letters, N, K, and W exclusively, and partial use of A. Calls beginning with N are reserved for the Navy and Coast Guard; while the other three letters are used both by government and private stations.

The assignment of radio station calls within the continental United States, Alaska and other possessions, is a function of the U. S. Federal Communications Commission. The general assignment pattern for the principal classes of stations follows.

Coast stations use three letters, from KAA or WAA through KZZ or WZZ.

Aeronautical stations use three letters and a digit, such as KAA2.

Fixed coastal telephone in Alaska, three letters and two digits, such as KAA20.

Other land stations, three letters and three digits, KAA200, for example.

Mobile telegraph, other than ship and aircraft, four letters and one digit.

Similar mobile telephone, two letters and four digits.

There are ten other classes of stations. Included are lifeboats and liferafts. Their call is the call sign of their parent ship or aircraft plus two digits from 20 to 99 inclusive. Amateur stations have a call sign of one letter, one digit, and two letters, such as K5AA or sometimes two letters before the digit, and two or three after it.

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MEDICINE

More Penicillin Planned At World Health Meeting

➤ MORE penicillin for the anti-syphilis drives now being waged in five European countries and for Europeans sick with pneumonia or other penicillin-curable illness may be available as a result of a conference of penicillin production experts held in Geneva, Switzerland.

The conference was held under World Health Organization auspices. Its object was to learn how to start up penicillin production in former UNRRA plants now standing idle in several European countries. Specialists in penicillin production were asked to attend from England and Denmark and representatives were invited from Byelorussia, Czechoslovakia, Poland, Ukraine and Yugoslavia as well as technical experts from the countries where the UNRRA plants are located.

Overcoming the widespread shortages of all types of medical supplies in many of the war devastated areas is one of the first tasks facing the WHO Special Office for Europe which has just been set up in Geneva with Dr. Norman D. Begg as acting director. The penicillin production conference was called to help solve some of the shortage problems.

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MEDICINE

World Code Against Making Doctors P.O.W.'s Is Asked

➤ AN international medical code which, among other things, would prevent making prisoners of doctors in time of war and would guarantee them "complete professional freedom" is urged by the International Committee of Military Medicine.

The committee's stand is reported to American physicians by Dr. Jules Voncken of Liege, Belgium, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 19).

The lessons of the Nuremberg trials should not be forgotten, he points out. The coming diplomatic conference in Geneva this spring "should not be permitted to end before it has established an international code of medicine."

The World Health Organization and the World Medical Organization, Dr. Voncken states, "should take a stand as soon as possible on this problem which affects the future of all medicine."

The code proposed by the committee is as follows:

1. The physician must render the same aid to his friend or to his enemy.

2. In no case should the physician be disturbed at having given aid to a wounded person whatever the nationality, race, religion or opinion of the injured, and whatever may be the circumstances in which the wounded is found.

3. The physician can never in any manner cooperate in works of general or individual destruction.

4. As a result, this set of duties confers on the physician a legal status, according to which he cannot be made a prisoner and according to which he must be granted in all times, and in all places, the right of his complete professional freedom.

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VETERINARY MEDICINE

Pig Ill May Be Polio Clue

Dying pigs behind the Iron Curtain may contribute to the conquest of human polio because the new virus disease attacking them is similar to infantile paralysis.

➤ BECAUSE pigs in Czechoslovakia are dying of a new virus disease, similar to infantile paralysis in children, there is new hope that from this agricultural disaster will come understanding and perhaps a cure for human polio.

Seldom does a new disease appear in the world. Yet only about four years ago did scientists begin intensive study of this illness which had first appeared in 1931 in a country now behind the Iron Curtain.

It spread to neighboring lands. It took 150,000 pig lives in Czechoslovakia last year, a heavy toll of the swine population.

This new disease is Teschen disease, or porcine virus encephalomyelitis. Its short name comes from that of a Czech province. To veterinarians and farmers, it is a menace to livestock raising, to agriculture and to the food supply.

To medical men intent on fighting human disease, the important thing is that the new Teschen disease is the animal counterpart of infantile paralysis. It is spread by a virus, not a germ. It paralyzes the muscles of the pigs, just as in humans. A large portion of the animals die from paralysis because treatment after they get the disease is not practical. (*See SNL*, Oct. 2, 1948).

There are no iron lungs for pigs or hospitals to care for these ill animals. Ruthless slaughter of infected animals is the only preventive known. Czechoslovakian scientists also are working on vaccines to stop the disease.

To American farmers the new pig disease seems remote and perhaps unimportant. But there are hints that some cases of Teschen disease are occurring in North America. There are a few instances that look like the same kind of pig illness, although it is too early to be sure. Our animal disease fighters have been alerted.

To the Food and Agriculture Organization of the United Nations, with headquarters in Washington, Teschen disease is an important problem, despite the fact that it is prevalent in Soviet-dominated areas where investigations are likely to run into snags.

A meeting for planning the fight against Teschen disease and other important animal ills was held last fall in Warsaw by FAO and the invaded and menaced countries were represented, even Bulgaria, which is not a member of FAO. At present there is one FAO veterinary scientist in Poland assigned to this disease. Countries bordering Czechoslovakia have done a good job in stopping by slaughter the spread of the disease into their areas. But little information about the situation has been circulated and American scientists have not realized the dangerous situation.

Neither has the opportunity to study this polio-like pig disease been seized yet by the investigators who are spending some of the dimes contributed by Americans honoring Franklin D. Roosevelt by supporting the infantile paralysis fight. When this new opportunity for research is realized, this new and promising possibility will undoubtedly be explored by sending medical research teams into the Teschen disease area.

So far the investigators of the animal disease are at a loss to know how Teschen disease is transmitted, whether insects play a part, whether diet is involved, whether some pigs have immunity and why. This is not surprising, because despite extensive research, little more is known about the human disease, infantile paralysis.

Dr. K. V. L. Kesteven, the FAO adviser on animal diseases, believes that if the problem of Teschen disease is solved, the conquest of polio would be speeded. Working with an animal disease has one great advantage, for there can be extensive use of experimental methods unthinkable with human beings. To Czech farmers losing pigs, this may be little consolation. But it may save the lives of many little children.

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WILDLIFE

Menhaden Is America's Most-Caught Fish

➤ EVER hear of menhaden? It's America's most-caught fish, even though you've probably never eaten it.

No less than 950,000,000 pounds of menhaden were landed last year, tops for one species, the U. S. Fish and Wildlife Service reported.

Salmon and Pacific pilchards (sardines, to you) were next in total catches. But more menhaden was landed than the total for these two. Menhaden is not a food fish because of its rich oil. This oil has many uses which make the fish valuable. After the oil is extracted, the waste is used for fertilizer or feed.

The commercial catch of 4,500,000,000 pounds of all species last year was no record, the Service said. Thanks to inflation, though, commercial fishermen got more money than ever before.

San Pedro, Calif., is the nation's top fishing port, followed by Gloucester, Mass. Boston and San Diego are tied for third in the 1948 figures.

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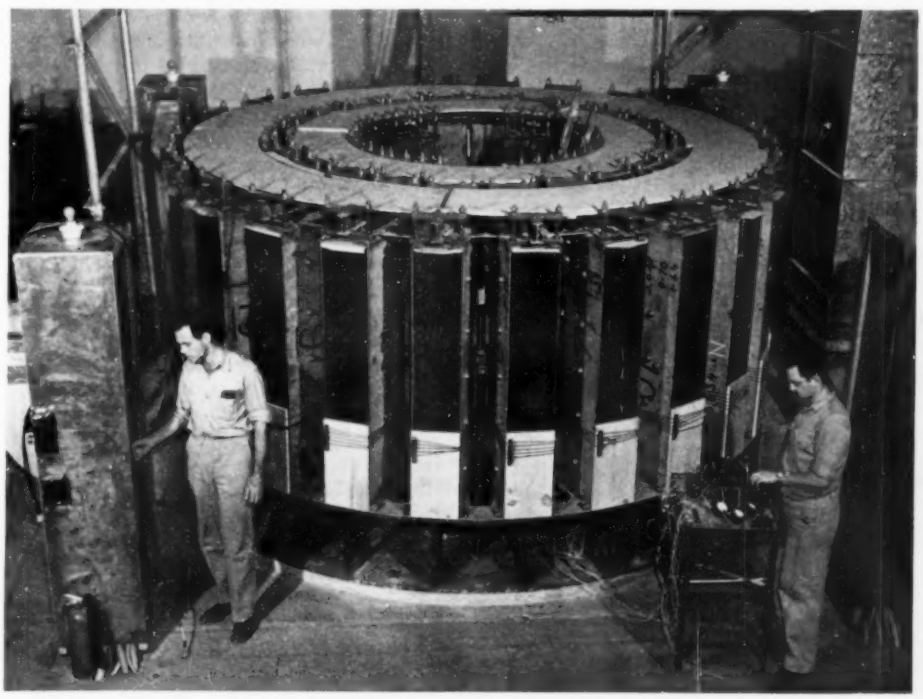

NEW SYNCHROTRON—This circular mass of steel and wire is Cornell University's new 300,000,000-electron-volt synchrotron. The 85-ton apparatus is shown being tested.

MEDICINE

New Seasickness Aid Found

➤ A SYNTHETIC chemical made to relieve hay-fever, hives and other allergies has turned into probably the best remedy and preventive yet found for seasickness and other forms of motion sickness. The chemical is called Dramamine. The lucky accident that revealed its anti-seasickness possibilities and an Army sponsored experiment proving them were reported by Drs. Leslie N. Gay and Paul Carliner of the Johns Hopkins Hospital at a meeting of the Johns Hopkins Medical Society, in Baltimore.

When the drug was on trial at the hospital's allergy clinic, it was given to a woman with hives who incidentally had suffered all her life from carsickness. Unexpectedly, the carsickness was relieved as well as the hives. The drug gave complete relief if the woman took one capsule a few minutes before boarding a streetcar.

The Hopkins scientists then tried it on other patients who got carsick or airsick. They were all completely free of discomfort if they took the drug just before getting on car or plane.

Seasickness trials were made last summer on the U.S.S. America. They were so encouraging that the drug was reported to the Chief of Staff and the Surgeon General of the Army. Seasickness was an especial problem to the Army during the war. Many drugs were tried but those apparently successful produced other symptoms as seriously handicapping as the motion sickness itself. Dramamine is without this disadvantage.

A special study of seasickness was carried out on the Army transport General Ballou during a voyage from New York to Bremerhaven last December with 1,376 men aboard. The Ballou, built originally for the Pacific, was chosen because its narrow, high construction promised a rough midwinter Atlantic crossing with the likelihood of much seasickness.

One group of men was given the drug as a preventive. They got a capsule as the ship left the harbor, six hours later and then before each meal and before retiring. Less than two percent who got the preventive doses developed seasickness. Of those given the drug to cure seasickness after it had developed, all but three percent got complete relief.

Dramamine is not yet available commercially. It is made by the G. D. Searle and Co. of Chicago. Its full chemical name is betadimethylaminoethyl benzohydryl ether 8-chlorotheophyllinate.

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Letters To The Editor

Progress More Nearly Equal

➤ IN reference to my report titled "British Lead in Bevatron" SNL, Feb. 19, it is true that last autumn England was leading the world in the development of billion-electron-volt accelerators. This fact probably prompted the acceleration on the accelerator program now in operation in the U. S.

I have just returned from the New York meeting of the American Physical Society and the Berkeley meeting of the American Physical Society and find that the statement that could be made last autumn is not applicable now.

The recent developments in this country in the construction of machinery for this billion-electron-volt energy range seem to indicate that progress is more nearly equal at present.—M. L. Pool, Ohio State University.

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Mint-growing, in the Pacific Northwest, is becoming an important farm activity now producing a $4,000,000 crop; oil distilled from the *peppermint* is used as flavoring in chewing gum, medicines and candy.

The West Texas-New Mexico *oil* region now has over 27,000 petroleum-producing wells, yielding 857,000 barrels daily.

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SCIENCE NEWS LETTER
VOL. 55 FEBRUARY 26, 1949 No. 9

52,000 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAte 4439.

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ASTRONOMY

Milky Way Light Changed

Although not apparent to the naked eye, light from distant stars in the Milky Way is made to vibrate more in one direction than in another.

➤ LIGHT from stars within the Milky Way, so clearly visible these winter evenings, differs from light reaching us from other stars in the heavens.

To the naked eye it may seem no different from other light, yet it dances in a restricted way. It vibrates more in one direction than in another. Scientists call it "polarized" light.

Light from faint stars within the Milky Way is unusual in that as much as 12% more rays vibrate in one plane than in another, Dr. W. Arthur Hiltner of Yerkes and McDonald Observatories of the Universities of Chicago and Texas reports in SCIENCE (Feb. 18). His studies were conducted with the McDonald 82-inch reflecting telescope.

Dr. John S. Hall of the U. S. Naval Observatory states in the same issue that work with the 40-inch reflector at Washington also indicates that light from the Milky Way stars is polarized.

Furthermore, the amount of polarization appears to be the same for light of different colors, Dr. Hall says.

Ordinary light might be considered a sensation caused by looking end-on at a large number of violin strings, vibrating in random planes or directions. If more strings vibrate in one plane than in another, this light is said to be polarized.

A piece of polaroid will let through light vibrating in only one plane just as a directional antenna receives certain radio waves. Such polaroid film is used for sunglasses to cut down glare.

If we examine polarized light through a piece of polaroid, the intensity of this light will change as the film is rotated. The brilliance of stars in the direction of the Milky Way was found to be dimmed as much as 12% by turning the polaroid.

This change in intensity can be measured accurately by a photoelectric photometer. Such a device, which converts light into electrical energy that can be measured precisely, was used for the study.

Dr. Hiltner's photoelectric photometer incorporated polaroid film. Dr. Hall constructed a "flicker" photometer in which the polarizer is rotated at a fixed speed.

The two astronomers originally worked together at McDonald Observatory on this important research which for the first time has shown that starlight reaching the earth from certain regions of the sky is polarized.

Light from stars well separated from the Milky Way gives no evidence of polarization. Since these stars are basically similar to those in or near the plane of the Milky Way, it must be assumed that the light is not polarized when it leaves the distant stars. Thus interstellar particles known to exist between us and such Milky Way stars must be assumed in some way to change the direction in which the light vibrates.

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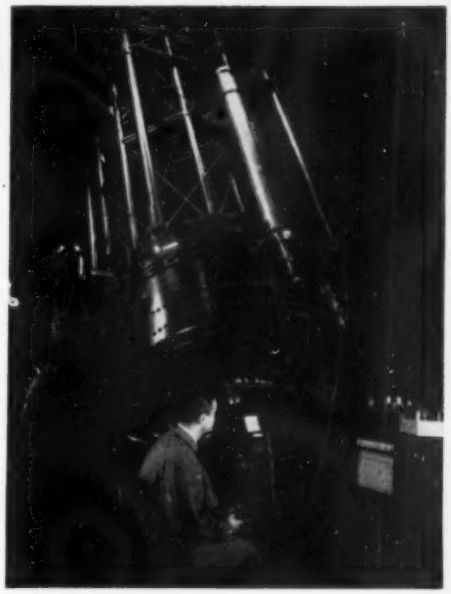

EXAMINING POLARIZED LIGHT—Here is shown the scanning mechanism and photometer mounted on the 40-inch reflecting telescope at the U. S. Naval Observatory. The A. C. amplifier and automatic recorder shown at right were used by Dr. Hall in this work.

ENGINEERING

Germanium for Transistors

➤ A TINY BIT of germanium metal may soon be used instead of a vacuum tube in radio receivers and other instruments where simple amplifying is required. In telephony and electronics in general the germanium device has great possibilities, the American Institute of Electrical Engineers was told by scientists of the Bell Telephone Laboratories. They revealed an improved germanium amplifier.

The device which utilizes this semi-conductor metal is called a transistor. Basic work on the transistor, which was announced in July, 1948, was carried on at the Bell Laboratories by Drs. John Bardeen and Walter H. Brattain. Later developments were described at the meeting by Dr. Winston E. Kock and R. L. Wallace, Jr. All four men are members of the laboratory's technical staff.

These transistors, the meeting was told, are about the size of medicine capsules but can perform most of the key jobs now done by vacuum tubes. They operate entirely without vacuum, they have no filament to cause warm-up delay, and they are smaller and lighter than commercially available vacuum tubes. They function on an entirely new physical principle discovered in the course of Bell Laboratories' program of fundamental research into the electrical properties of solids.

A unit has now been developed which promises to be more stable and efficient and to handle greater amounts of power than the type originally designed, the scientists revealed. Like the first model, the new transistor requires the use of a tiny pinpoint of germanium. In the first type, the metal was mounted at the base of a hollow cylinder, and two wire contacts were mounted above, their points resting on the germanium surface.

In the new unit, the germanium disk has depressions ground into each side of its center section, so that this center section is only a few thousandths of an inch thick. The disk is then fitted into the center of the cylinder and the point contacts, which emit and collect the current, are placed against it on opposite sides.

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GENERAL SCIENCE

Fewer "Extra Families" Now, Group Reports

➤ FEWER married couples are now living with in-laws than were before the war in 1940, a construction industry spokesman said.

Melvin H. Baker, chairman of the Construction Industry Information Committee, reported that some 2,100,000 married couples are now living as "extra families." This is 612,000 fewer than two years ago, and a drop of seven percent from 1940.

In 1940, he said, one in every 16 couples did not have its own household. At the peak of the housing shortage in 1947, one in every 12 was an extra family, and now only one in every 17 couples is doubled up in housing.

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CHEMISTRY

Improve Helium Liquefying

➤ THE HELIUM GAS that gives lift to American balloons is more easily converted into liquid form by improved equipment developed at the National Bureau of Standards. Liquid helium is becoming increasingly important in scientific investigations, particularly in studying the behavior of metals at temperatures in the region of absolute zero.

Helium long resisted attempts to liquefy it, but later was reduced to a liquid by a combination process that involved high pressure and low temperatures obtained with the help of more easily liquefied gases. Helium liquefies at a lower temperature than any other gas, approximately at a point eight degrees above absolute zero, which itself is approximately 460 degrees below the zero of the Fahrenheit scale.

At the temperature of liquid helium, metals such as lead and tin, ordinarily poor conductors of electricity, become what scientists call superconductors, with a complete loss of resistance to the electric current. The National Bureau of Standards, with the support of the Office of Naval Research, is now making studies seeking a more complete explanation of this and other low-temperature phenomena.

The improved helium liquefier was designed by R. D. Scott of the Bureau staff. It operates on what is known as the Simon principle, employed in equipment devised by F. Simon about 16 years ago. It differs from the usual type of Simon apparatus in that the liquid helium is delivered into an external receiver by means of a transfer siphon.

In devising the Simon process, which was a simpler method than those used earlier, F. Simon filled a strong, thermally insulated container with helium at 150 atmospheres pressure. After cooling with solid hydrogen to about 18 Fahrenheit degrees above absolute zero, the compressed helium was allowed to escape through a throttling valve. When the pressure had reached atmospheric, the container was found to be more than half filled with liquid helium.

The heart of the new Scott apparatus is a thick-walled monel chamber, designed to withstand a pressure of 4100 pounds per square inch, within which the helium is liquefied. This chamber has an outer jacket through which liquid hydrogen is pumped. Both are contained in an evacuated container, which is also surrounded by liquid hydrogen. A combination of high pressure and escaping helium forms the liquid.

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GENERAL SCIENCE

Soviet Claim to Antarctic

➤ THE RUSSIANS who have added discovery of the Antarctic to the airplane and countless other achievements which the Soviets say Russia did first apparently don't believe their own man. Or maybe Capt. Fadei Bellingshausen of Emperor Alexander's Antarctic expedition strayed from the party line about a century before the party was born.

The great Bellingshausen, one of the real heroes of early Antarctic exploration, is now listed by the U.S.S.R. as co-discoverer of the Antarctic. What the now generally accepted records show is that Bellingshausen did name the first bit of the Antarctic continent to be discovered.

But he named it after an American, a "Connecticut Yankee" whom he met there.

Discovery of the mainland is credited to Capt. Nathaniel Brown Palmer of Stonington, Conn. Palmer, a young man of barely 21, was master of the sloop, "Hero," searching for fur seals. In mid-November, 1820, he first sighted the Antarctic peninsula jutting north toward South America.

Nearly three months after his discovery, Palmer heard fog bells in the Antarctic night. The next morning, he was invited to board the Russian frigate, commanded by Bellingshausen who had been sent to explore the Antarctic waters by Emperor Alexander I. The young Yankee navigator told the Russian officer what he had seen.

So impressed was Bellingshausen, and so unmindful of future repercussions, that he exclaimed:

"What do I see and what do I hear from a boy in his teens; that he is commander of a tiny boat the size of a launch of my frigate and has pushed his way towards the Pole through storm and ice!"

Then, with even less respect for the claims of the future rulers of Russia, he added:

"I name the land you have discovered in honor of yourself, noble boy, Palmer's Land."

That the land was a part of a continent was not suspected with any certainty until another American, Charles Wilkes, led the U. S. Exploring Expedition down the Antarctic coast south of Australia in 1840. And it wasn't until the twentieth century that any relatively complete exploration of the continent was made.

Although the American sealer, Palmer, gets credit, except from the Soviets, for the first discovery of land in the Antarctic, it may have been sighted earlier by whalers. One Dirk Gerritsz, a Dutch sailor, is known to have been close to the continent as early as 1599, and he may have seen land.

The U. S. has never pressed any official claims in the Antarctic. Last fall, it was announced that the State Department had approached seven other nations about some form of internationalized settlement of the Antarctic claims.

Russia was not among the nations approached, although historically Bellingshausen was an important early explorer. But until the latest pronouncement from the Russian All-Union Geographical Society, the Russians had shown little interest in the area since the time of Bellingshausen.

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ZOOLOGY

California Youth Studies New England Island Life

➤ THE width of a continent is no barrier to the pursuit of a serious scientific hobby, in the case of Dwight W. Taylor, 17-year-old student at the Webb School of California, in Claremont. A resident of Altadena, he has spent three summers making a thorough study of the mollusks of Nantucket island, off the Massachusetts coast.

Mollusks constitute the animal group comprising clams, snails, squid and their relatives. Before Mr. Taylor's studies began, 46 molluscan species were known from Nantucket; he has increased the count to 120. His searchings have taken him all the way from the high, dry pinewoods and old cemeteries of the island down to the shoreline and out to numerous offshore islets and rocks. He has also dragged the sea bottom to depth down to 90 feet in a search for the more elusive species. He has digested his data to show the animals' ecological relationships, that is, their reactions and adaptations to the small worlds they live in. Mollusks, he finds, are limited in the range of life-conditions under which they can exist. For instance, one burrowing species found normally in hard clay becomes both stunted and deformed if it is forced to burrow in sand.

In addition to his Nantucket researches, Mr. Taylor is also studying the mollusks that live within a two-mile radius of his school, and also the species (mostly snails) that have become adapted to the extremely dry-land conditions prevailing in the Mohave desert. He is interested in fossil shells as well, especially those representing the Pleistocene ice age. He has found deposits of such shells both in California and on Nantucket.

Mr. Taylor has become so much interested in his subject that he is considering making it his life work. His early scientific work has already begun to pay dividends, for he is one of 40 high-school seniors from all over the country who are winners in

the Eighth Annual Science Talent Search for the Westinghouse Science Scholarships. He will be in Washington, D. C., March 3 through 7, attending the Science Talent Institute, at which time $11,000 in college scholarships will be awarded.

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ENGINEERING

Coating Makes Aviation Oil Tank Fire Safe

➤ SYNTHETIC RUBBER, in combination with other materials, is used for a coating on a new aviation oil tank which is claimed to be capable of withstanding fire and temperatures of 2,000 degrees Fahrenheit, the B. F. Goodrich Company of Akron, O., revealed.

The tank, developed for the U. S. Navy, is of particular value in combat aircraft but has other possible applications outside of aviation. These include fuel tanks for automobiles, buses and trucks, and the coating may be applied to gasoline tanks and other containers of volatile fuels.

The new tank is rigid and considerably lighter than other fuel tanks. It is bullet-sealing, a valuable asset in combat. During tests with a blowtorch, the tank was undamaged after prolonged exposure to temperatures greater than 2,000 degrees, Goodrich engineers declare. An ordinary aluminum fuel cell would disintegrate in less than a minute under the same treatment.

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ENGINEERING

Meter Records Audience Response to Program

➤ THE average opinion of a group of people listening to a speech or recital, or witnessing a performance can be determined by a device developed by General Electric which has been dubbed a "recording opinion meter." With it, up to 100 persons can indicate what they think of the program at one-minute intervals throughout the performance.

Each of the 100 persons holds a coffee-cup sized device which has a pointer that can be turned to Very Dull, Dull, Normal, Good or Very Good. Electric signals pass to the recording meter. A moving strip of paper continuously records the composite opinion. The strip is marked in units of one minute, so that its records can be matched with the various stages of the program.

The instrument is to be used by a New York advertising agency to study audience reactions to radio and television programs. Many other applications will probably follow, such as for use in previews of new Hollywood films. Since each individual's opinion is expressed secretly, the device records a true, uninfluenced group opinion.

Science News Letter, February 26, 1949

FIRE-RESISTING FUEL TANK—A powerful blowtorch has no effect on this coated aviation oil tank whereas an ordinary aluminum fuel tank disintegrated in less than 60 seconds under the same conditions.

GENERAL SCIENCE

Russians Quit WHO

There have been several signs pointing to their possible withdrawal, one being that there have been no Russians on WHO's staff.

➤ ALTHOUGH Soviet Russia's withdrawal from the World Health Organization seems to have come as a surprise to officials of the organization, there have apparently been a few signs pointing toward it.

One was the failure of Soviet Russia to attend the last meeting in Geneva of WHO's executive board of which she had been a member. The excuse given at that time was that the agenda for the meeting had not been received in time.

Second possible sign that Russia was considering withdrawal or at least was dissatisfied with the organization was the fact that there have been no Russians on WHO's staff. This was not for lack of being asked. The Soviet Union has been repeatedly asked for experts to serve on WHO's staff and technical committees but has not sent anyone.

Recalling that efforts to establish international control of atomic energy broke down over the inspection provision, it has been suggested in Washington that something of this sort might have caused the Soviet withdrawal from WHO. But this is not likely, since WHO does not go into a country unless that nation's government requests WHO assistance on some health problem. For example, WHO is now recruiting teams to demonstrate the use of DDT and other measures for control of malaria mosquitoes in the Orient. But this is being done at the request of various governments of Oriental countries for help in bringing malaria under control.

For the same reason, that WHO does not send experts or staff into a country unless invited, it is considered unlikely that the Soviet withdrawal means Russia is afraid WHO officials might discover any germ warfare plans Russia might be making.

Although WHO has till now been the outstanding example of Soviet cooperation in the international field, Russia has not lived up to the part of the WHO agreement which calls for regular reporting of communicable, or epidemic, diseases.

Science News Letter, February 26, 1949

Some *wild birds* like a shower bath; marsh hawks, for instance, are often seen sitting out in a heavy rain with wings spread to enjoy the wetting.

MEDICINE

New Operation Restores Man's Swallowing Ability

➤ A SURGICAL feat which restored a man's ability to swallow holds hope for veterans who can't swallow because of war injuries. The operation was developed by a team of surgeons at the University of California Medical School with the aid of X-ray motion pictures, monkeys and rerouted muscles.

The patient had been forced to take all his food through a tube leading to the stomach as a result of a gunshot wound which had severed several nerves essential in swallowing. He had been despondent and was on the point of suicide when he came for help to the surgeons.

The man is now living a normal life, working at manual labor and is able to eat any kind of food.

The physicians, Drs. Howard Naffziger, Cooper Davis and H. Glenn Bell, made a careful study of the whole subject of swallowing, then the patient by means of X-ray motion pictures. They found the swallowing mechanism was so complex and so rapid that it was necessary to run the pictures in slow motion in order to see just what did happen.

On the basis of their studies, they produced the same effect in monkeys by severing the proper nerves. They then performed the operation which was successful.

They discovered that several key muscles were paralyzed in the throat of the patient which prevented movement of the Adam's apple. This was remedied by attaching a new set of muscles to the bone just above the Adam's apple. The man also suffered from choking when he swallowed because the injured muscles ballooned out into the side of the neck. The physicians used healthy tissue to pin back these muscles.

This new operation is reported in the ANNALS OF SURGERY, (Oct.-Nov. 1948.)

Science News Letter, February 26, 1949

CHEMISTRY

Fireproof Lubricants Made from Fluorocarbons

➤ FIREPROOF lubricants which do not thicken with cold or thin from the heat of an engine may find important military applications as well as civilian use.

Fluorocarbons, chemical compounds containing carbon and the gaseous element fluorine, were discussed by scientists at a conference sponsored by the Office of Naval Research in Washington.

As lubricants, chemists foresaw possible use of fluorocarbons under extreme conditions such as in flaming jet aircraft engines or for the small gyroscopes on gun mountings which are now being run at higher speeds than they were during World War II.

Hydraulic brakes which take up the energy of recoil of guns and catapult launching devices for aircraft on shipboard may use fluorocarbon fluids in the future.

Cost of fluorine gas to use in forming these unusual chemical compounds was cited as a factor limiting present production. But the unusual ability of these compounds to resist burning may make them worth almost any price, representatives of jet aircraft manufacturers indicated.

Important properties as an electrical insulator may make a fluorocarbon type of synthetic rubber important. Manufacturers of synthetic rubber are following this possible development, it was disclosed at the conference.

Science News Letter, February 26, 1949

GENERAL SCIENCE

Science Refresher Course To Be Given Teachers

➤ SCIENCE teachers, who, like the rest of us, have difficulty in keeping up with the rapid progress of modern science are going to get some help.

Fifty secondary school teachers will get a six-week refresher course in science at the Massachusetts Institute of Technology in Cambridge, Mass., this summer. They will study new advances in science on fellowships granted by the Westinghouse Educational Foundation. A total grant of $62,500 will make it possible for 50 teachers to receive grants of $250 each summer for the next five years, Dr. James R. Killian, Jr., president of the Institute, announced.

Science News Letter, February 26, 1949

ELECTRONICS

Voltage Distribution of Lightning Stroke Modeled

➤ NOBODY knows much about the voltage distribution of a lightning stroke passing through a wire, but General Electric scientists in Pittsfield, Mass., have perfected a model from photographs that may give some idea.

The completed model, in three dimensions, resembles in appearance an ordinary topographical chart to show the contour of mountain ranges. It represents the distribution voltage in a coil of wire through which a simulated lightning stroke passed for only 250 millionths of a second. It graphically shows the voltage peaks and valleys resulting from the current.

Height of the model indicates the variations in voltages, width represents time in millionths of a second. Length of the model traces the location of the impulse in the winding.

The model was made from photographs taken of oscillograph readings of the windings. The negatives were projected on fiber board, which was patterned out accordingly and mounted on a wooden base.

Science News Letter, February 26, 1949

IN SCIENCE

GENERAL SCIENCE

One in Eight Married Women Are Wed More Than Once

➤ ABOUT one out of every eight married women in the United States has been married more than once, statisticians of the Metropolitan Life Insurance Company in New York figure.

Widows and divorcees account for one-sixth of all recent brides, they report. Wives who have been married more than once are relatively more frequent now than at any time in the past 50 years or more.

The chances of remarriage have increased at every period of life but "the greatest improvement" is seen among widows and divorcees at the younger ages, the statisticians point out. At the 25- to 34-year-age range, more than three-fifths of widows and divorcees were remarried in 1940, compared with about one-half in 1910.

At ages 65 to 74 there has been only a slight increase in remarriages. This the statisticians find "understandable because the chances for remarriage among widows and divorcees at the ages past middle life have been adversely affected in recent decades by the growing deficit of eligible men at the older ages."

All this remarrying "as would be expected has increased the proportion of families resulting from second or subsequent marriages."

Science News Letter, February 26, 1949

ENGINEERING

Asphalt Emulsion Makes Earth Dams Water-Tight

➤ LEAKY EARTH dams can be made water-tight by use of an asphalt emulsion injected into the dam through driven pipes, the Shell Oil Company revealed. A permanent underground dam is built by means of the asphalt; no excavating is necessary.

The process, which has already been thoroughly tested, utilizes an emulsion known as Shellperm. In use, the asphalt preparation, mixed with water, is pumped under low pressure through a metal pipe driven into the ground. Emerging from the pipe, the emulsion spreads out roughly in the form of a bell. Chemicals mixed with the emulsion cause the asphalt to coalesce, producing a mass impermeable to water.

Following the first injection, the pipe is raised, and additional emulsion applied to top the first. Later the pipe is moved to make adjacent columns until the entire dam is made leak-proof.

Science News Letter, February 26, 1949

E FIELDS

GENETICS

New Light Shed on Corn And Pellagra Relationship

➤ NEW light on the relation of corn to the hidden hunger disease, pellagra, appears in a discovery of Dr. Alvin Nason, of the botany department of Columbia University,

It has long been known that people whose staff of life came from corn rather than wheat were likely to get pellagra unless they got the anti-pellagra vitamin, niacin. Corn does not supply enough of this vitamin to ward off the disease of the ugly rash, sore tongue and disordered mind.

Recently it has been discovered that tryptophan, an amino acid, is a sort of parent chemical to the vitamin, niacin. Animals and bacteria that get tryptophan plus vitamin B_6 apparently can make niacin in their bodies.

Now Dr. Nason finds that the embryos of genetically high-niacin corn will synthesize more niacin if they are fed tryptophan. And they do not need any extra vitamin B_6 to do it.

Tryptophan, however, is probably too expensive to feed to corn in order to increase the plant food's niacin content.

Science News Letter, February 26, 1949

PHYSICS

Magnetic Properties Best When Atoms Are Aligned

➤ MAGNETIC alloys have better magnetic properties when their atoms are in an "ordered state" rather than in their natural "hodge-podge" condition, the Physical Society of Pittsburgh was told by Dr. J. E. Goldman, Westinghouse scientist. The atoms are "lined up" by special heat treatment, he said.

The part that heat treatment plays in bringing out the better magnetic properties was recently demonstrated at the U. S. Naval Ordnance Laboratory when attempting to reproduce in this country an excellent magnetic material used by the Germans during the war. The chemical make-up was easily determined, but the heat treatment required to bring out its best magnetic properties took several years to determine.

The improvement in magnetic properties, according to Dr. Goldman, may also improve the ability of such metals to produce more powerful sound waves. Sound wave generators, using these magnetic properties, are called magnetostrictive oscillators. They are used to kill bacteria, or in underwater work to safeguard navigation or map the ocean floor.

A rod of metal, properly treated to arrange the atoms, will expand and contract a tiny fraction of an inch when subjected to an alternating magnetic field. By magnetizing such rods with a high-frequency current, they can be made to vibrate up to hundreds of thousands of times a second and generate ultrasonic waves, waves too rapid to be audible to the human ear.

"The magnetic behavior of metals and alloys is determined largely by the position of the atoms that make it up," Dr. Goldman theorized. "By carefully controlling which atoms go into what position, a process we have learned to perform in the laboratory, we can govern to a large extent the magnetic behavior of the metal and learn more about the mystery of magnetism."

Science News Letter, February 26, 1949

PHYSICS

Soft Iron Holds Magnetism Longer at Low Temperature

➤ PROOF of correlation between temperature and retention of magnetism in soft iron magnets has been produced by a 17-year-old student at New Brunswick High School in New Brunswick, N. J., Elihu A. Boldt. His experiments were performed on the dining-room table of his home, with the simplest kind of apparatus.

It has long been known, Mr. Bolt explains, that steel magnets are much more nearly permanent than soft iron ones; as a matter of fact, the latter lose their magnetism very quickly after the electric current that induces it is shut off. It is also well known that heating a steel magnet causes it to lose some of its magnetism.

These facts aroused in his mind a curiosity as to whether an opposite condition, like chilling to the temperature of dry-ice, would cause magnetism to last longer in a soft iron bar.

He placed his iron bars, with the electric coils that were to magnetize them, in insulated glass jars, which he subjected to four different temperatures: that of the room itself, the boiling and freezing points of water, and the temperature of solid carbon dioxide or dry-ice, which is almost 80 degrees below zero Centigrade. During each experiment, he placed an ordinary pocket compass near the bar, measuring the bar's loss of magnetism by the time required for the compass needle to swing away from its deflected position back to normal.

Each test was repeated 30 times, and the periods required for loss of magnetism reduced to an average. A definite correlation between retention of magnetism and lowering of temperature was demonstrated.

Mr. Boldt is one of 40 winners in the Eighth Annual Science Talent Search who will meet in Washington, D. C., March 3 through 7, to attend the Science Talent Institute.

Science News Letter, February 26, 1949

CHEMISTRY-ENGINEERING

Tracer Marks Progress of Oil Through Pipeline

➤ THE atomic energy equipment at the Oak Ridge National Laboratory is helping the oil industry with a tracer to show the progress of oil as it travels through hundreds of miles of pipline, the Atomic Energy Commission revealed.

A radioactive barium isotope is introduced into the oil in the pipline and travels with the oil. Its position can be located at any time by the use of a Geiger counter carried along near the pipe on the outside. When this instrument, the standard device used to locate and measure radioactivity, is near the barium isotope, it sends a signal to the operator's ear.

No danger results from the introduction of the radioactive barium in the crude oil. It completely disappears during the refining process. Location of the exact position of a particular sample in the oil pipeline is important for efficient direction of each type of crude oil into proper channels at the refinery.

Experiments in the use of the product of the uranium chain-reacting pile in the Oak Ridge National Laboratory are being made by the California Research Corporation, a subsidiary of Standard Oil Company of California. Results to date indicate that the method will be generally applicable to the tracing of fluid flow through pipes and to the study of the fundamental behavior of flowing fluids.

In an experiment relating to improvements in producing better petroleum fuel, the same laboratory is using radioactive carbon to learn more about what happens to gasoline molecules as they pass through the complex operations of a modern refinery.

The chemist labels a gasoline molecule by substituting a radiocarbon atom for an ordinary carbon atom.

Science News Letter, February 26, 1949

GENERAL SCIENCE

Rare Nepal Relics Given To Smithsonian Institution

➤ RARE relics from the little known Himalayan kingdom of Nepal have been added to the collections of the Smithsonian Institution in Washington as a tribute to American courtesy.

The bronze figures, a rock crystal lamp and other religious objects have been transferred to the Institution by President Truman, who received them as a gift from the government of Nepal for courtesies shown in Washington to trade representatives of the Asiatic country after World War II.

Long closed to foreigners, Nepal is now being explored by an American expedition sponsored by the Smithsonian, the National Geographic Society and Yale University.

Science News Letter, February 26, 1949

MEDICINE

Measles Death Rate Is Cut

Potent anti-measles substance isolated from blood can either prevent measles entirely or modify the attack. New drugs are curing complications of disease.

By JANE STAFFORD

➤ MOTHERS need not worry so much when little Johnny or Mary breaks out with pink spots and the doctor says: "Measles!" The death rate is down to one-fiftieth of what it was three decades ago and children don't get nearly as sick as they once did.

Thank good red blood, given by patriotic Americans, for this great medical advance —for one of the great factors in making measles easier and safer to have is the potent anti-measles substance, called immune serum globulin, available through the Red Cross blood program.

Sulfa drugs and penicillin do their chemotherapeutic part in fighting measles. And Mother knows now better ways of taking care of the young patients—doctors are called more promptly, the children get to the hospital when they need to and those likely to spread the infection are kept isolated.

In modern times measles has been a killer chiefly through its complications. Over 90% of the deaths from measles were due to pneumonia. When the sulfa drugs came along and then penicillin to cure pneumonia, many child lives could be saved.

Drugs Aid Disease Fight

The sulfa drugs and penicillin also have saved many a youngster from the worst results of another complication of measles, middle ear trouble and mastoiditis. Although not so often fatal as pneumonia these complications are commoner and in pre-sulfa days often led to deafness.

The most severe complication of measles today is encephalomyelitis. This is an inflammation of the brain and spinal cord. Fortunately it is rare, because when it does occur it kills about 10 out of every 100 of its victims and may leave as many as 65% of the survivors permanently damaged in mind or body.

Now children can be saved not only from measles death but from the earaches, the days and weeks of fever, the loss of strength, the threat of permanent damage to mind and body. This is being accomplished through immune serum globulin.

Immune serum globulin comes from blood. Most if not all of it so far has come from the blood Americans donated so generously to the American Red Cross for our armed forces during the war. The blood was donated and used primarily to save the lives of the wounded. In the early years of the war the red cells of the blood were separated from the plasma and the latter was used for transfusions for the wounded. This was because at that time whole blood could be preserved for only seven days, while dried plasma keeps for five years.

At the end of the war there was a surplus of nearly 5,000,000 units of human dried plasma which the armed services returned to the Red Cross. During the war years, meanwhile, Dr. Edwin J. Cohn of Harvard had developed methods of separating blood plasma into various fractions. One of these fractions was serum albumin which provides in concentrated form the effect plasma has in preventing or overcoming shock. Because it can be packaged in smaller space and does not require the addition of water before use in transfusion, as dried plasma does, it began to be substituted for dried plasma for the armed forces in the closing years of the war.

Blood plasma contains many other substances besides the albumin. Scientists have discovered more of them than they know clinical uses for, and believe there may be still others.

It is the plasma part of the blood that contains the antibodies to disease germs which the body builds up in defense against germ invasion. Since almost all grown persons in the United States have had measles, the pooled plasma collected from donors to the Red Cross contained the measles antibodies in generous measure. They are in the blood plasma fraction separated out as gamma globulin and packaged for use as immune serum globulin.

Antibodies in Blood

Antibodies for other diseases, such as mumps and scarlet fever, are also present in the blood of normal adults and therefore in the gamma globulin fraction. But their concentration is relatively low and the blood fraction does not contain enough to be useful, though fractions from

MEASLES MADE EASIER AND SAFER—A measles victim now has an easier time of it than he once did, thanks to modern medical discoveries and better information about the disease.

convalescent patients, who have more antibodies in their blood, are proving useful.

Immune serum globulin can prevent measles entirely or can modify the attack so that it is only a mild sickness with scarcely any danger of complications. Children under three years, sick children and sick grown-ups who have never had measles if exposed to the disease get a dose big enough to ward off an attack entirely. This spares them the disease which might prove fatal in their state.

The immunity to measles given by this big dose, however, is not lasting. So doctors prefer to give healthy children, when exposed to measles, a dose just big enough to let them have a mild attack. In this way they get a chance to build up in their own bodies the antibodies that will last them the rest of their lives.

The surplus immune serum globulin and that made since the war from surplus dried plasma has been given back free of charge by the Red Cross to the American people, who gave the blood, for use when and where needed. More than a million doses have been distributed to doctors, hospitals and health departments since 1944, and about 600,000 during the fiscal year 1947-48. The commercial value of this 600,000 doses is nearly $3,800,000. The patients who got it had to pay only for the services of the doctor or hospital for administering the dose.

The big measles year of 1947-48, used up a lot of the immune serum globulin. In that same year, however, the National Blood Program of the American Red Cross was inaugurated and on Jan. 12, 1948, the first regional center of the program opened in Rochester, N. Y. Aim of this program is to collect, process and distribute enough blood and its health-giving fractions to meet the needs of the entire nation for transfusions, for measles-fighting and for any other use that can be found for blood.

Science News Letter, February 26, 1949

PSYCHIATRY

Shock for Mental Illness

➤ USING electric shock treatments in a prophylactic way to prevent return attacks of mental illness in patients who have recovered is now being tried by two Canadian psychiatrists, Dr. J. J. Geoghegan of Guelph, Ont., and Dr. G. H. Stevenson of London, Ont.

Good results in the first three years of a five-year test period are reported by the psychiatrists in the AMERICAN JOURNAL OF PSYCHIATRY. (Jan.).

A single electric convulsion is induced about once a month in the patients, starting after recovery from the most recent attack of mental illness. The theory behind the prophylactic convulsions is that electric convulsions often end a manic or a depressive attack of illness. This being the case, the doctors reasoned that an induced convulsion might break up and dissipate accumulating tensions before they reached the point of definite mental illness.

The trial of the method is being made on a group of patients each of whom had two or more attacks of mental illness in the preceding five years. During the three years of prophylactic electric convulsions none of the 13 has had any return of mental illness.

By contrast, every one of a group of 11 similar patients who refused the prophylactic treatment has had one or more attacks of mental illness in the three years.

The method has disadvantages. Many patients dislike the electroshock treatment so much they would rather risk an attack of mental illness than look forward to a long series of electroshock treatments. The treatments themselves are not without danger. There are also economic disadvantages such as time lost from work and cost of the treatment. These, the psychiatrists feel, are offset by the time lost and expense of repeated attacks of mental illness.

"Nevertheless," they state, "we consider it the duty of the psychiatrist to keep the patient well and to prevent recurrences of mental illness, if possible."

Until some better preventive method is found, they believe prophylactic electroshock should be tried.

Science News Letter, February 26, 1949

ENGINEERING

New Circuit Breaker Makes High Voltage Lines Safe

➤ COMPRESSED air is used to literally blow out a flaming short-circuit arc on a high-voltage electric power line by a new circuit breaker, the American Institute of Electrical Engineers was told in New York by Benjamin P. Baker and Erling Frisch, Westinghouse engineers.

The new circuit breaker is a safety device, developed for the protection of power systems and for high voltage use in congested metropolitan and residential areas. It is super-safe, they said, because it contains nothing more inflammable than compressed air. It is designed for use in a 69,000-volt system. It was described as the "highest-rated compressed air circuit breaker yet designed for outdoor service in such a system."

This device is capable of stopping an electrical surge of 3,500,000 kilowatts, they said. If a short circuit occurs and a tremendous surge of current travels along the line, the breaker opens the circuit and halts the surge before it can damage the power system. Any arc forming between the interrupted contacts is extinguished by the released high-pressure air.

Science News Letter, February 26, 1949

Words in Science— SILICONES

➤ A FAMILY of synthetic resins, born of slippery organic compounds wedded to gritty silicon, basic constituent of sand and glass, is known under the name of the silicones. This is pronounced silly-cones.

Many new products are being made from these organic compounds of silicon. Greaseless lubrication good at extremely high or low temperatures; a water-repellent film that can be applied to fabric or paper and that will withstand dry cleaning and washing; better rubber tires; longer-lived electrical insulation. These are some of the major products made possible by silicone chemistry.

Science News Letter, February 26, 1949

YOUR LIFE IS IN YOUR GLANDS

By Herman H. Rubin, M.D.

• Within recent years much has been said and written about the Endocrine Glands and their hormones.

• Do you know what these hormones are, where they are produced in your body, and how they affect your mental, physical and sexual health, your appearance, personality and behavior, your span of life?

• You will find the answer to these, and other vitally important questions in Dr. Rubin's fascinating book. Written in a vivid style, in simple non-technical language everyone can understand.

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BOTANY

How to Grow Plants in House

Hints on flower pot gardens and how to make them flourish; new technique of chemical feeding of flowers and vegetables grown without soil.

➤ LITTLE indoor gardens kept in flower pots play a part in the home life of almost everyone. They may range all the way from the scores of thriving plants kept by active housewives to the single struggling rubber tree of a crowded city apartment. Everyone can have a few green leaves and maybe a flower or two around the house.

Planting in Flower Pots

The conventional flower pot has been found, through many generations of use, well suited for growing plants indoors. A few hints may be useful, however to make sure of their proper management.

In the first place, the pot should be large enough for the plant that is to grow in it. It is to be remembered that most plants spread their roots at least as far as they spread their branches, and farther. Even a seemingly big pot, therefore, is close quarters for a plant, and the deficiency will have to be made up to the crowded roots by ample water and rich earth.

But not too much water, and neither too much nor too little earth. If you fill the pot too full, you will be washing part of it over the rim, or slopping water over, and in any case you will be encouraging a heap of dry dust to form above the level of the edge. If you put in too little, the natural settling of the soil will bind the roots down into the narrow end of the pot, in half the space they were intended to have; and of course the less earth in the pot the lower is the fertilizer supply available for the plant and the more likely one is to over-water and turn the soil into a mass of bricky mud. There is a happy medium: one finger-width (that excellent, flexible old unit of measurement!) below the rim of the pot.

If Soil Is Not Good

The time-honored way of keeping houseplants in pots of garden soil is excellent—if you have good soil to start with. However, many of us who live in cities are handicapped by not having any good soil in our own backyards. Instead, we are all too likely to have sterile stuff that was thrown out when the basement was dug for our apartment house, perhaps mixed with building debris and later accumulations of cinders. Plants can't thrive on that. And even when they are started with good soil in their pots, houseplants eventually use up its initial supply of the chemical elements they need for their life-activities. So to the soil in the pots, whether good or poor to start with, it is often necessary to add new supplies of these elements.

This may sound as if you had to be a chemist or a plant physiologist in order to keep your houseplants going. It isn't really as complicated as that. You can get from any well-stocked drugstore the few things needed, for the major mineral elements in plant nutrition are only seven: potassium, magnesium, calcium, phosphorus, sulfur, nitrogen and a little bit of iron. These are not supplied to the plant separately, but paired with each other in compounds: potassium phosphate, magnesium sulfate, calcium nitrate, with the iron also coming as a sulfate.

Plant Chemicals Ready to Use

It is possible to get these compounds ready made up and weighed out in vials, to be dissolved in water for a balanced plant ration. When you get a set of the balanced-ration chemicals, all you need to do is dissolve them in water according to directions, and water your plants with that solution instead of ordinary tap-water.

It will be easy to make up the solutions, because the chemicals in the Science Service Soilless Gardening Kit have all been weighed out in the right proportions for the best nourishment of plants. The chemicals for the nutrient solution are in plastic bottles.

To make six gallons of solution, just empty all the large bottles except the one of ferrous sulfate into 24 quarts or six gallons of water. It is best to used distilled water, such as you can get at your auto service station, but if this is not convenient, ordinary tap water will do.

Do not mix in the ferrous sulfate until you are sure you are ready to use the solution, because if it stands the iron salts will precipitate out. In the case of this chemical, you don't need to use all the contents of the vial—one-eighth of the contents of the bottle is plenty to meet the iron requirements of the plants, because they need very little iron for growth.

There is nothing about this solution to spoil, and it will keep indefinitely, but you don't need to make it all up at one time unless you feel like it. To mix a smaller quantity, just use a proportionate part of the chemicals. For example, to make up two gallons, or eight quarts, use one vial of the potassium acid phosphate, two-thirds vial of magnesium sulfate, and one-third vial of calcium nitrate.

In addition to the elements mentioned, certain others are needed in extremely small quantities or "traces". It is not necessary to add any of these, however, for they are contained as "impurities" in the chemicals in your kit. These are not the highly purified chemicals used in the laboratory, but what is known as the "technical grade."

Only one precaution: Do not keep your solutions in metal containers; use glass or pottery. You can mix them in aluminum, however.

With this nutrient solution it is possible to keep plants healthy and vigorous when they are growing in the poorest of soils. It even enables you to grow plants without any soil at all; increasing numbers of people are having a lot of fun doing this—a thing that used to be possible only to scientists in research laboratories.

Gardening Without Soil

It is often easier, cleaner and more interesting to do without soil altogether in gardening in the house. Since the chemical solutions furnish the materials needed by the plants for growing, it is possible to use for the "soil" substances that don't contribute to the growth process.

One of the most convenient of these is a kind of mica material, called vermiculite. This is light in weight, much lighter than sand or gravel. It is clean and easy to handle. And it can be used over and over again.

Instead of conventional clay garden pots, there are now available attractive green pots made of processed cardboard that can be kept flat in little space and assembled when needed.

This material is contained in the Science Service Soilless Gardening kit, along with the chemicals, seeds, etc.

To plant seeds, first fill one of the little pots with vermiculite up to about a half inch from the top. The next step is to lay the seeds on top of the "soilless soil."

The number of seeds that you plant in one pot depends upon the size of the seed. For big soybeans, use only one to a pot. Use two each of sunflower, gourd and nasturtium. Use four of the okra and radish seeds. The tomato seeds are smallest; you can plant as many as six of these. Radishes or gourds will come up fastest and so if you like to see results quickly, begin with those.

Next cover your seeds by adding another quarter inch of the vermiculite. Then water.

Kit Is Available

For those who wish to utilize this novel method of home gardening, Science Service, as a part of its non-profit activities for the popularization of science, has assembled and made available a kit for soilless gardening. Full directions are given in a booklet on how to use the kit, and additional information is given on extending

hydroponics to large-scale use. In this kit there are a dozen green pots, the chemicals the plants will need, seven kinds of interesting seeds suitable for soilless gardening use, a box of vermiculite, which is the shiny stuff that serves as soil but isn't really. In addition there are two vials of plant growth-promoting chemicals, one with which you can grow seedless fruit in your outdoors or indoors garden and the other which you can use to promote the growth of roots on cuttings for vegetative propagation of plants.

All this material is contained in the Science Service SOILLESS GARDENING kit that will be sent postpaid anywhere in the U.S.A. for a remittance of $4.95 addressed to Science Service, 1719 N St., N. W,. Washington 6, D. C. Be sure to ask for the Soilless Gardening Kit.

Science News Letter, February 26, 1949

MEDICINE

Chemical Lead to Cancer

➤ A GOOD lead toward the possibility of some day being able to do something with chemicals to cure cancer seems to have been found by scientists working with vitamins, antivitamins and related compounds.

In some cases children with acute leukemia, which is a cancer of the blood, got better temporarily following treatment with a chemical called aminopterin. But the chemical is dangerous. Some patients were lost because of the drug's toxic effects. All patients were in the last, hopeless stages of their disease before getting it. They did not recover, but the temporary improvement, or remissions, encourages the scientists to go on with research on these chemicals.

Studies on this and newer chemicals, called An-Fol-A and Amino-An-Fol, were reported by Drs. T. H. Jukes, E. L. R. Stokstad and A. L. Franklin of Lederle Laboratories, Pearl River, N. Y., at a New York Academy of Sciences symposium.

The An-Fol part of the names of these new drugs shows that they are analogues of, or similar to, that relatively new and exciting vitamin, folic acid.

These new chemicals are also being tried, very cautiously, in two other malignant conditions, Hodgkin's disease and lymphosarcoma. And at the Sloan-Kettering Institute, the antivitamins, or folic acid antagonists, are being tried on experimental tumors in animals, in the hope of gaining still better leads to possible chemical cures for human cancer.

Antivitamins, or at least some of them, also have antihormone effect. In chicks, they can check the effect on growth of female sex hormone chemicals, Drs. R. Hertz and W. W. Tullner of the National Cancer Institute, Bethesda, Md., found.

Such interference with a hormone by an antivitamin, they think, may help both to explain the mechanism of hormone action and to develop chemicals of curative value.

Science News Letter, February 26, 1949

ENGINEERING

Magnetic Alloy Developed

➤ A NEW magnetic alloy of superior properties, developed by the U. S. Naval Ordnance Laboratory, has proved exceptionally valuable in magnetic amplifiers for use instead of delicate electronic tubes. The Navy has named it Orthonol.

The Navy's interest in research in magnetism, and the development of this superior magnetic alloy, was discussed by Dr. G. W. Elmen, internationally famous scientist in the magnetic alloy field, and Edward A. Gaugler, both of the Naval Ordnance Laboratory, as guests of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

Orthonol, like others, is an iron-nickel alloy, but one in which the best magnetic qualities are brought out by a different heating treatment. The "ortho" in its name comes from a Greek word meaning rectangular, and the "nol" stands for the Naval Ordnance Laboratory.

The reproduction in this country of the German magnetic alloy known as Permenorm 5000-Z at the Navy laboratory was also discussed by these scientists. It was used during the war in Germany in the fabrication of huge rectifiers and applied in the electro-chemical industry. Its chemical make-up was easily determined, but the heat treatment required to bring out its best magnetic properties took several years to determine. In the year since the process was discovered, and the information released to the public, several manufacturers have started making it, and found several valuable applications. It is an important alloy, but is said to be somewhat inferior to the new Orthonol.

Without magnetic metals we would have practically no industry, Dr. Elmen declared. The transfer of electrical energy to mechanical energy would be impossible. Our vast production lines would be non-existent. We would have no electric lights, no telephones, and practically none of our modern conveniences.

The Navy's primary interest is the Nation's security, and the job of the Bureau of Ordnance is to provide weapons for the Navy. All the research carried on by the Bureau's activities is directed toward that end. But for the efficient operation of these weapons, magnetic metals, in one form or another, are essential.

Science News Letter, February 26, 1949

NUCLEAR PHYSICS

New Diagram Shows How Atom Bomb Might Be Made

➤ A DIAGRAM showing how an atomic bomb might be built has just been published.

The diagram, drawn in the form of a conventional bomb, is really more like a gun, explains Lt. Col. David B. Parker, General Staff Corps, in the ANTIAIRCRAFT JOURNAL (Jan.-Feb.), published in Washington by the United States Coast Artillery Association.

His drawing shows a fuze and powder charge. Half of the fissionable material, either uranium 235 or plutonium, is at the end of a gun barrel and the other half is in the breech. A highspeed bullet would set off the chain reaction of the atomic bomb.

Science News Letter, February 26, 1949

AGRICULTURE

Save on Pea Processing By Using Froth Flotation

➤ A PROCESS first used to concentrate ores in the mining industry is saving $600,000 a year in the processing of peas.

The process is froth flotation in which floating is used to separate materials. Cracked peas, pea skins, nightshade berries and tar-weed seeds are now floated out of batches of peas in the way foreign material is floated out of ore.

Developed at the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry laboratory in Pullman, Wash., the froth flotation process is expected to save an estimated $2,000,000 yearly in the future in the cost of processing peas for canning or freezing.

Science News Letter, February 26, 1949

Archaeology

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BOTANY

NATURE RAMBLINGS
by Frank Thone

First Flowers

➤ SPRING-FLOWER season, we are prone to think, is still a good month away, in the North at least. It will come, according to the reckoning of most of us, with buttercups and johnny-jump-ups and delicate but hardy little windflowers. Some of us may make a concession to pussywillows and alder catkins and the soft dark fire of the silver-maple bloom that drives early bees mad; though somehow we always reckon these as only half-flowers. A flower without either scent or colored garments hardly rates.

Yet there is one flower so impatient to be out and about its business that it is very likely to be found pushing its way up through thin snows, or cracking the crust of ice on the wet places where it grows. It meets the requirements, too: it has a colored floral envelope, and it has a scent—even though we finicky humans turn up our noses at it. It is the skunk cabbage.

The sheath of the skunk cabbage is not a petal structure at all; it is really a modified leaf enclosing an entire flower-head that may have dozens of tiny, crowded flowers on it. It is analogous to the more ornate sheaths of such plants as the calla lily and the Jack-in-the-pulpit—to which, indeed, the skunk cabbage is fairly closely related.

The odor of the skunk cabbage, though offensive to human nostrils, is given out only in return for some initial offense. So long as the plant remains intact its scent is sealed up within it; but if it is kicked or trampled the scent escapes to tell the world of the outrage that has occurred. The early Revolutionary War flag that displayed the device of a coiled rattlesnake with the warning motto: "Don't tread on me!" might almost as well have substituted a skunk cabbage for the serpent. Only, chemical warfare hadn't been invented at that time.

All of us except the most "nose-deaf" can appreciate the appropriateness of the "skunk" part of the plant's name; but why the "cabbage"? That isn't evident now, but it will be more so later. For the skunk cabbage is one of those plants in which flowers precede leaves, being developed and fed to maturity from reserves stored in a thick root-stock underground. Later on come the big, broad leaves, which are not unlike the free outer leaves of a cabbage plant in general outline. Like the flowers, they are highly scented; and it is at this stage of its development that the skunk cabbage most closely fits its name.

There is a third phase, that comes late in autumn or even in early winter, after strong-scented flowers and leaves have long since disappeared. You may be hiking through boggy woods, and come upon some very attractive orange-red objects, of a general egg shape, but spiky all over. These are the fused fruits of the skunk cabbage, containing the seeds that help to provide for coming generations.

Science News Letter, February 26, 1949

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ARCHAEOLOGY

Indians Lived Underground

See Front Cover

➤ IF ATOMIC or biological warfare ever drives modern Americans underground, they won't be the first Americans to dig themselves in.

How peaceful Stone Age American Indians went underground has been unearthed in the Southwest by scientists from the Chicago Natural History Museum.

These early underground Americans apparently holed up without any threat of war. The history which is being pieced together of the roving Stone Age Cochise Indians and the Mogollones who built pit-houses in southwest New Mexico is strange compared with most history. These Indians, it appears, spent 6,000 years at peace.

Dr. Paul S. Martin, who led the expedition into the Southwest last summer, explains that the Cochise Indians apparently roamed around southeastern Arizona and southwestern New Mexico about 4,000 B. C. searching for water. Only remaining evidence of these nomadic Americans yet found was 12 feet below the surface at a flowing spring called West Leggett in southwest New Mexico. Here the Chicago scientists discovered Stone Age tools of these ancient Indians.

What went on for the next 5,500 years is pretty much a blank. But about 500 A. D., the oldest known pit-houses of the Mogollones were built, or rather dug.

They were simply a cellar with a roof. The "last word" in pit houses has been designated Pit-house K. It is approximately 28 by 28 feet and about four feet deep. The scientists speculate that "K" was probably at least a chief's home, and more likely a ceremonial chamber, as shown on the cover of this week's SCIENCE NEWS LETTER.

Five husky modern workmen needed two weeks to excavate the pit, and it must have taken the primitive Indians at least twice as long to build it, not counting the preparation of the logs which supported the roof.

For nearly 500 years, the Indians of the Southwest lived in pithouses. Then, about 1,000 A. D., they began to emerge and live on the surface in pueblos.

Why these wanderers dug into the earth and for five centuries lived in cellars is one of the mysteries the scientists hope to unravel with more discoveries in the ancient home of the Cochise and Mogollones.

Science News Letter, February 26, 1949

ENTOMOLOGY

Tailor-Made Weather Will Test Insects' Endurance

➤ WEATHER like this winter's in the West, or like next summer's in Death Valley, will be made to order in new entomological laboratory facilities now under construction at Michigan State College in East Lansing, Mich. Extreme temperature conditions over a wide range of humidities will be used in testing the endurance of insects.

The idea is to find out what conditions are most likely to discourage various species of insect pests, so that man can make a more effective ally of General Winter in the endless defensive warfare he has to wage to keep his place on this bug-beleaguered planet.

Conversely, conditions favoring useful insects will also be useful knowledge, for man's use in keeping his small friends alive and active.

Science News Letter, February 26, 1949

Large unexploited deposits of *oil* are thought to lie under Louisiana's bayous and marshes.

Indonesia is now the official name for what was long known as the Netherlands Indies.

• Books of the Week •

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ADVANCES IN CATALYSIS AND RELATED SUBJECTS, VOLUME I—W. G. Frankenburg, V. I. Komarewsky and E. K. Rideal, Eds.—*Academic Press,* 321 p., illus., $7.80. Surveys of different sections of the field, each contributed by a specialist.

THE APPRAISAL OF TERRAIN CONDITIONS FOR HIGHWAY ENGINEERING PURPOSES—*Highway Research Board,* 91 p., illus., paper, $1.50. Describes modern techniques such as use of air photographs and evaluation of the vegetation.

THE ATMOSPHERES OF THE EARTH AND PLANETS—Gerard P. Kuiper, Ed.—*University of Chicago Press,* 366 p., illus., $7.50. A group of technical papers presented at the 50th Anniversary Symposium of the Yerkes Observatory.

AVIATION MEDICINE IN ITS PREVENTIVE ASPECTS: An Historical Survey—John F. Fulton—*Oxford,* 174 p., illus., $3.50. Intended to aid the general reader in understanding the origins of this new field.

COSMIC RAY PHYSICS—D. J. X. Montgomery—*Princeton University Press,* 370 p., illus. $5.00. A survey of work done up to the present for the student who already has intermediate or advanced training in other branches of physics.

DISCOVERERS FOR MEDICINE—William H. Woglom—*Yale University Press,* 229 p., illus., $3.75. The romantic stories of great medical discoveries that were made by individuals who were not medical scientists, including the singing teacher who devised the laryngeal mirror and the statesman who invented bifocal spectacles.

DOCTORS OF INFAMY: The Story of the Nazi Medical Crimes—Alexander Mitscherlich and Fred Mielke, Translated by Heinz Norden with statements by Andrew C. Ivy, Telford Taylor and Leo Alexander—*Schuman,* 172 p., illus., $3.00. Testimony and documents reported by the head of the German Medical Commission to Military Tribunal No. 1, Nuremburg.

ENGINEERING THE NEW AGE—John J. O'Neill—*Ives Washburn,* 320 p., $3.50. A science writer presents his own ideas on how man can make the most of the "new age" that he will soon be living in.

AN EXPERIMENTAL STUDY OF SUBMARINE SAND BARS—Garbis H. Keulegan—*Beach Erosion Board,* 40 p., paper, free on request to publisher, Office of Chief of Engineers, Department of the Army, Washington 25, D. C.

THE FACE OF THE MOON—Ralph B. Baldwin—*University of Chicago Press,* 239 p., illus., $5.00. The study of the moon, says the author, gives us a mirror with which to study our own earth.

FIFTH REPORT TO CONGRESS ON ASSISTANCE TO GREECE AND TURKEY FOR THE PERIOD ENDED SEPTEMBER 30, 1948—U. S. Department of State—*Govt. Printing Office,* 36 p., illus., paper, 15 cents. Showing the extent and kind of military aid rendered.

GEOLOGY AND ORIGIN OF SOUTH PARK, COLORADO—J. T. Stark and others—*Geological Society of America,* 188 p., illus., $3.75. Report on an extensive, strikingly flat basin framed by strongly contrasting, rugged mountains.

GEOPHYSICAL CASE HISTORIES, VOLUME I, 1948—L. L. Nettleton, Ed.,—*Society of Exploration Geophysicists,* 671 p., illus., $7.00. Reports by 61 authors of geophysical explorations representing a sharing of experiences on the part of many experts and companies.

HOMING PIGEONS—Herbert S. Zim—*Morrow,* 63 p., illus., $2.00. A book for children and their elders with practical information on how to raise, keep, and race pigeons. Engaging drawings by James Gordon Irving.

THE LITERATURE ON STREPTOMYCIN 1944-1948—Selman A. Waksman—*Rutgers University Press,* 112 p., $3.00. A bibliography of 1171 entries and author and subject index. Includes also the text of the first official announcement of the isolation of streptomycin.

MINERALS AND HOW TO STUDY THEM—Edward Salisbury Dana and revised by Cornelius S. Hurlbut, Jr.,—*Wiley,* 3d ed., 323 p., illus., $3.90. For the amateur collector of rocks and other beginners in mineralogy.

NEW TECHNIQUE FOR WASTE PICKLE LIQUOR NEUTRALIZATION—Richard D. Hoak and Charles J. Sindlinger—*Mellon Institute,* 6 p., paper, free upon request to publisher at University of Pittsburgh, Pittsburgh 13, Pa.

AN OCEAN WAVE MEASURING INSTRUMENT—*Beach Erosion Board,* 28 p., illus., paper, free upon request to publisher, Office of the Chief of Engineers, Department of the Army, Washington 25, D. C.

PREHISTORY AND THE MISSOURI VALLEY DEVELOPMENT PROGRAM: Summary Report on the Missouri River Basin Archaeological Survey in 1947—Waldo R. Wedel—*Smithsonian Institution,* 52 p., illus., paper, 55 cents.

SAFEGUARDING MOTHERHOOD—Sol T. DeLee—*Lippincott,* 135 p., illus., $2.00. Clear information for the pregnant woman who wants to know the anatomical and physiological details of her condition, together with advice on pre-delivery and post-delivery care. The drawings are especially clear.

STRATIGRAPHY AND FAUNA OF THE AGUA SALADA GROUP, STATE OF FALCON, VENEZUELA—H. H. Renz—*Geological Society of America,* 219 p., illus., $2.75. A region of clays forming low, rolling hills covered with dry scrub along the coast and with dense tropical forest inland.

THYROID FUNCTION AS DISCLOSED BY NEWER METHODS OF STUDY—J. H. Means, Ed.—*New York Academy of Sciences,* 228 p., illus., paper, $3.00. New disclosures have been made possible through such means as tracer studies with radioactive iodine, techniques of enzyme chemistry and phylogenetic approach.

WORLD PHILOSOPHY: A Search for Synthesis—Oliver L. Reiser—*University of Pittsburgh Press,* 127 p., $2.50. Developing the philosophical theory of scientific humanism—and attempt to see things together as a whole.

YOUR CHILD FROM 6 TO 12—Children's Bureau—*Govt. Printing Office,* 141 p., illus., paper, 20 cents. A readable book giving parents information and expert advice on the care and upbringing of their young children—how to keep them healthy and happy and prepare them for independent living.

YOUR TEETH—HOW TO SAVE THEM—Herbert Tahraes—*Public Affairs Committee,* 32 p., illus., paper, 20 cents. Useful, practical information in readable style.

Science News Letter, February 26, 1949

CHEMISTRY

Whole Eggs Have Been Preserved by Freezing

➤ PRESERVING whole eggs by freezing, a hitherto impossible process, has been achieved at Louisiana State University in Baton Rouge, La., by Dr. Socrates A. Kaloyereas. The trick is to extract enough of the eggs' water content, by a combination of vacuum and dehydrating agents, to permit the expansion of yolk and white that occurs upon freezing, and thus avoid rupturing and generally "messing up" the eggs.

Dr. Kaloyereas presents a preliminary report on his results in SCIENCE (Feb. 18), and states that complete details will be published elsewhere in the near future.

Science News Letter, February 26, 1949

Science Service Radio

➤ LISTEN in to a discussion on "Conserve or Perish" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, March 5. Dr. Paul B. Sears, professor of botany and head of the department at Oberlin College, Oberlin, O., and Dr. William Vogt, chief of the Conservation Section of the Pan-American Union in Washington, D. C., in addition to winners of the Eighth Annual Science Talent Search, will be guests of Watson Davis, director of Science Service. As a part of the Science Talent Institute being attended by the high school winners, Drs. Sears and Vogt will join in a discussion of the important problem of how to keep the world fed and yet save the world from wasting its forests, soils, water and wild life.

Science News Letter, February 26, 1949

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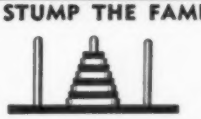

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⚙ *MOUSETRAP permits the prowler to see the bait, but never to touch it because it is enclosed in a clear-view plastic compartment. From any direction the mouse approaches, he steps onto a spring platform that drops him through a trap door into a chamber below, which has a perforated aluminum base to facilitate drowning.*

Science News Letter, February 26, 1949

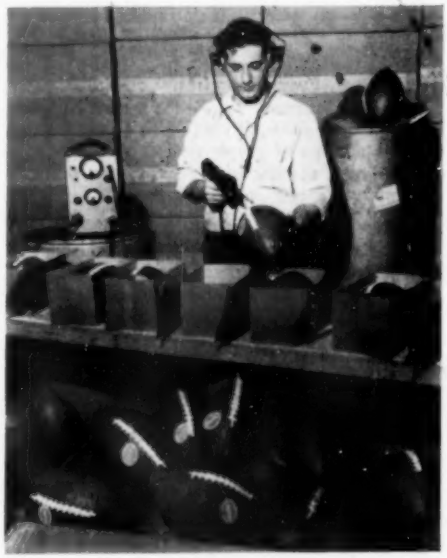
⚙ *MULTIPLE COUNTER, for counting all sorts of small objects from pills to screws in the packaging process, has up to ten parallel channels down which the articles flow from a holding shaker. The small objects cut photoelectric beams as they fall from the individual channels.*

Science News Letter, February 26, 1949

⚙ *PLASTIC CANISTERS, to hold food in refrigerator or pantry, come in sets of three in proper sizes to nest within each other when not in use. Their airtight lids keep the contents fresh and clean, with no odor getting in or out.*

Science News Letter, February 26, 1949

⚙ *LEAK DETECTOR for use in high-vacuum work finds a modest application in testing footballs. The pistol-like device, held in the operator's hand in the picture, sucks in air and makes a buzz in the ear*



if the air contains gases of the Freon group. Footballs under test are filled with such a gas.

Science News Letter, February 26, 1949

⚙ *PHONOGRAPH, capable of handling all new speeds as well as records of conventional speed, has two pick-up arms, one for conventional records and the other for the two speeds in use for the new long-playing records. Brass collars, to slip over the normal spindle, handle the center hole-size problem.*

Science News Letter, February 26, 1949

⚙ *GARMENT BAGS, designed for use in automobiles, are made of a translucent plastic and have zipper closures to make them dust proof. Large enough to accommodate men's and women's suits, they can be carried by their handle hooks to hotel closets, or to home closets for storage.*

Science News Letter, February 26, 1949

⚙ *HOME AIR-CONDITIONER, that cleans and controls the humidity of air passing through it, vaporizes a chemical known as triethylene glycol into the air stream to kill certain types of airborne bacteria. Its glass fiber filter is continuously flushed by a liquid to clean it and add moisture to the air.*

Science News Letter, February 26, 1949

⚙ *MITTENS for youngsters are lined with double-fleece for warmth and covered with durable, waterproof neoprene, a synthetic rubber. The wrists contain enough of the neoprene for protection against melting snow and rain.*

Science News Letter, February 26, 1949

Do You Know?

Although Canada produced nearly 48,000,000 pounds of *honey* in 1948, there is a decreasing demand because candy makers and bakers are now able to get sugar.

The king of Egypt is reported to be buying two British *helicopters* to use in mail delivery, but more extensively in spraying crops to control insect pests.

The use of a *coffee beverage* is perhaps a thousand years old but the process of roasting the beans was not used until during the 16th century.

Two guest houses have been erected in *Greenland* in expectation that this great Danish island will soon attract many American tourists.

A living *electric catfish*, placed on the brow of a patient with epileptic fits, was used by a Moslem doctor several centuries ago to give relief.

The United States is the largest user of *apparel wools* in the world, consuming 1,000,000,000 pounds annually, of which some three-fourths are imported.

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